

1, 2, 3...GO METRIC

Suggested Grade

7

SD Mathematics Strand & Standard (*Primary for Task*)

Measurement

7.M.1.1 Select, use and convert appropriate unit of measurement for a situation including capacity and angle measurement.

Task Summary

Students will select from various activities to explore the metric system of measurement.

Time and Context of Task

After completing instructional unit on the metric system, I give the students 3 class periods to work on their selections.

Materials Needed

Paper, pencil, and other basic classroom supplies depending upon the activities the student selects.

Author and Lead Teacher for this Task

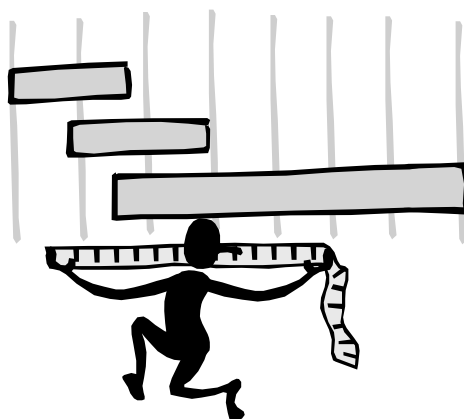
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From the following chart, you are to select one activity from each column.

1	2	3
Find five labels from five different products that use the metric system of length, capacity, or mass and display them in order from smallest to largest.	Make a poster or PowerPoint of the metric system that explains the six prefixes we discussed in class.(Kilo-, hecto-, deca-, deci-, centi-, and milli-)	Create a test of 20 questions to assess your classmates on the metric system. You must have at least four different types of questions and cover length, capacity, and mass. You must include an answer sheet.
Complete a Metric Me Profile .	Create a set of flash cards or a game using metric measurements.	Research a career that uses the metric system and write a report about how and why that career uses the metric system instead of our customary system.
Make a drawing of the floor plan of your bedroom using metric measurements.	Write a poem, song, or story that would help others learn about the metric system.	Find someone who uses metric measurement in their workplace. Interview them on their use of the metric system. Present a written summary of what you learned from that person.



1, 2, 3....Go Metric Assessment

Names _____

Choose one activity from each column.

1	2	3
Find five labels from five different products that use the metric system of length, capacity, or mass, display them in order from smallest to largest and explain your thinking for putting them in order.	Make a poster or PowerPoint of the metric system that explains the six prefixes we discussed in class.(Kilo-, hecto-, deca-, deci-, centi-, and milli-)	Create a test of 20 questions to assess your classmates on the metric system. You must have at least four different types of questions and cover length, capacity, and mass. You must include an answer sheet.
Complete a Metric Me Profile for each person in your group.	Create a set of flash cards or a game using metric measurements.	Research a career that uses the metric system and write a report about how and why that career uses the metric system instead of our customary system.
Make a scale drawing of the floor plan of your bedroom using metric measurements. Include doors and windows.	Write a poem, song, cheer, or story that would help others learn about the metric system.	Find someone who uses metric measurement in their workplace. Interview them on their use of the metric system. Present a written summary of what you learned from that person.

Metric Me Profile

Name _____

My Height _____

My Arm Span _____

My Waist _____

Length of my arm _____

Length of my foot _____

From top of my hip bone to floor _____

My Wrist _____

Length of my pinky finger _____

Length of my finger nail on index finger

Length of my nose _____

Length of my hair _____

Circumference of my head _____

Straight line distance between my ears _____

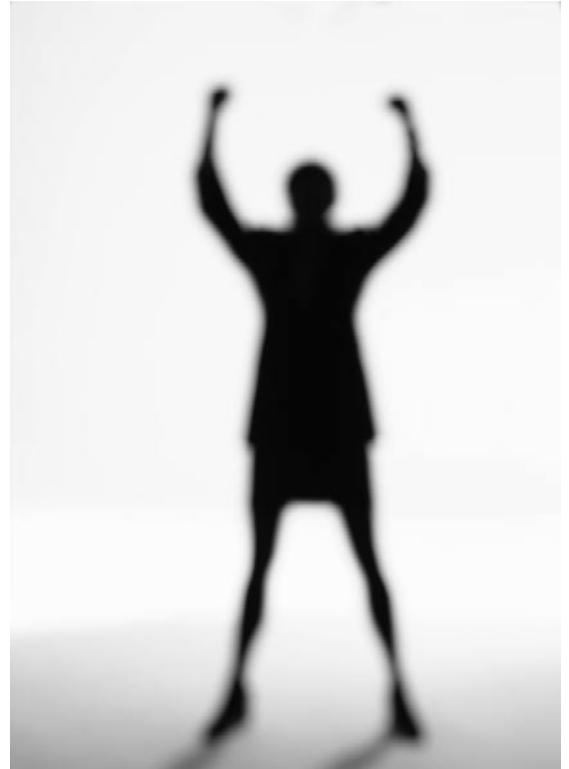
Circumference of my neck _____

Distance from my knee to floor _____

Distance I can jump from a standing start _____

My vertical jump height _____

The number of me lying head to toe it would take to equal the length of a football field and explanation for how I got my answer.



CONTENT STANDARDS

Primary Standard

Strand Name: Measurement

SD Goal: Students will apply systems of measurement and use appropriate measurement tools to describe and analyze the world around them.

Indicator: Apply measurement concepts in practical applications.

Standard: 7.M.1.1 Select, use and convert appropriate unit of measurement for a situation including capacity and angle measurement.

NCTM Process Standards

Communication

Organize and consolidate their mathematical thinking through communication.

Communicate their mathematical thinking coherently and clearly to peers, teachers, and others. Use the language of mathematics to express mathematical ideas precisely.

Connections

Recognize and use connections among mathematical ideas. Recognize and apply mathematics in contexts outside of mathematics.

Representation

Create and use representations to organize, record, and communicate mathematical ideas.

Problem-Solving Strategies

- Drawing pictures, graphs, and tables
- Modeling

ASSESSMENT TOOLS

Task Rubric

	Advanced (4)	Proficient (3)	Basic (2)	Below Basic (1)
7.M.1.1 Select, use and convert appropriate unit of measurement for a situation including capacity and angle measurement.	All tasks demonstrated ability to select use and convert appropriately within the metric system.	Most tasks demonstrated ability to select use and convert appropriately within the metric system.	Some tasks demonstrated ability to select use and convert appropriately within the metric system.	None of the tasks demonstrated ability to select use and convert appropriately within the metric system.
Communication	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.
Completion	All tasks completed demonstrating a thorough and in-depth understanding of the metric system.	All tasks are completed and demonstrate a strong understanding of the metric system.	All tasks are completed and demonstrate a basic understanding of the metric system.	Not all tasks are completed or there is little demonstration of understanding of the metric system.
Group Cooperation	Worked well with partner, made good use of class time and observed work was shared equally.	Worked well with partner, made good use of class time and most work was equally shared.	Some problems with partner, usually made good use of class time, or one person appeared to be doing majority of work.	Had problems working with partner, staying on task and completing work together.

**Seventh Grade Measurement
Performance Descriptors**

Advanced	Seventh students performing at the advanced level: <ul style="list-style-type: none"> • use perimeter, circumference, and area formulas to solve problems; • select, use, and convert appropriate units of measure to solve problems; • draw and use grids to estimate the area of a shape.
Proficient	Seventh grade students performing at the proficient level: <ul style="list-style-type: none"> • select and use the appropriate formula to find the perimeter, circumference, and area of a shape; • select and use appropriate units of measure; • convert units of measure.
Basic	Seventh grade students performing at the basic level: <ul style="list-style-type: none"> • given the formula find the perimeter and area of a shape; • select appropriate units of measure.

**Seventh Grade Measurement
ELL Performance Descriptors**

Proficient	Seventh grade ELL students performing at the proficient level: <ul style="list-style-type: none"> • explain and use formulas in measurement situations; • create scale drawings; • solve problems accurately involving standard two-dimensional shapes; • read, write, and speak the basic language of measurement.
Intermediate	Seventh grade ELL students performing at the intermediate level: <ul style="list-style-type: none"> • use formulas in measurement situations; • use measurement terms to explain how to solve problems; • give simple oral or written responses to directed questions on topics presented in class.
Basic	Seventh grade ELL students performing at the basic level: <ul style="list-style-type: none"> • select and use appropriate measurement tools for a variety of situations; • recognize and use basic measurement terms; • respond to yes or no questions and to problems presented pictorially or numerically in class.
Emergent	Seventh grade ELL students performing at the emergent level: <ul style="list-style-type: none"> • recognize and name measurement tools; • give simple oral responses to directed questions on topics presented in class; • copy and write measurement symbols; • imitate pronunciation of numbers and measurement terms; • use non-verbal communication to express measurement ideas.
Pre-emergent	Seventh grade ELL students performing at the pre-emergent level: <ul style="list-style-type: none"> • observe and model appropriate cultural and learning behaviors from peers and adults; • listen to and observe comprehensible instruction and communicate understanding non-verbally.

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Student Work Samples



As you examine the samples, consider the following questions:

- In light of the standard/s addressed and the assessment tools provided, what evidence does the work provide that students are achieving proficiency in the knowledge and skills addressed by the standard/s for the task?
- Is the task/activity well designed to help students acquire knowledge and demonstrate proficiency? Is the task/activity clearly aligned with the standards? In what ways would you adapt the task/activity to better meet the needs of your students?

Student Work Sample #1



Math Worksheet

Name: _____

Convert these measurements

- 20 cm = _____ mm
- 3 kg = _____ dg
- 5 kL = _____ L
- 6.9 km = _____ cm
- 74 m = _____ mm
- .36 m = _____ km

Match the prefix with the meaning

7. Kilo-	A. Thousandth
8. Hecto-	B. Hundredth
9. Deci-	C. Hundred
10. Centi-	D. Thousand
11. Milli-	E. Tenth

Circle the correct answer

12. 2 L = _____ mL. 200 mL 2,000 mL

13. 99 cL = _____ L	.9 L	.99 L
14. 60 g = _____ mg	60 mg	600 mg
15. .159 kg = _____ g	159 g	1,159 g
16. 79 mm = _____ cm	7.9 cm	79 cm
17. 26 cm = _____ m	.26 m	26m

True or False
Write T for True and F for False

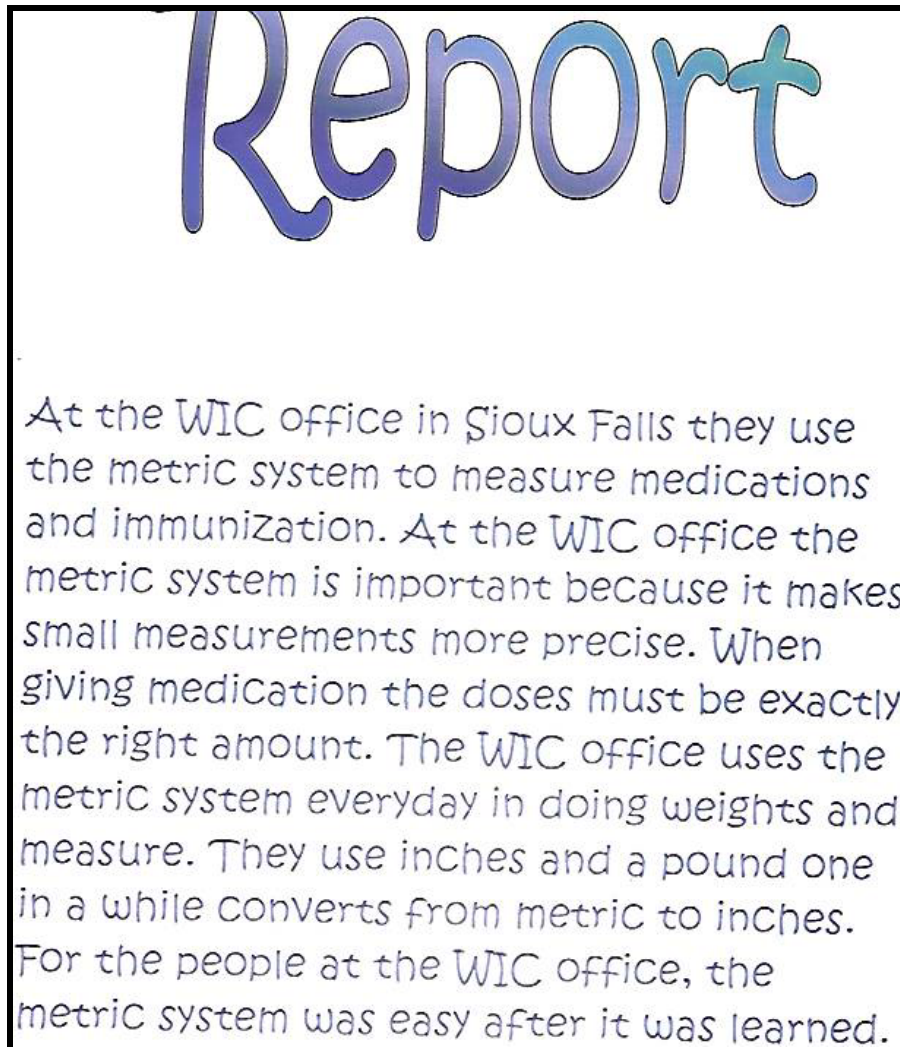
18. A centigram is smaller than a milligram.

Looking at Student Work – Instructor notes and rating for work sample #1:

An example test that was created by students that had a proficient rating according to the above rubric used to assess this project.

They showed a very good understanding of the metric system, but were short two questions and had an incorrect answer on their answer sheet.

Student Work Sample #2



Looking at Student Work – Instructor notes and rating for work sample #2:

An example of an advance report based upon the above rubric. They cited ways and places that the metric system was used in their parent's line of work, even eluding to the fact that once learned it is an easier system to use.

Student Work Sample #3

Metric Song

*If you yearn to learn then listen up. We got
meters, liters, grams, and they all go by tens. King
Henry died Monday drinking chocolate milk. If you
want to remember then there it is kilo, hecto, deca,
meters, deci, centi, milla, forizzle my nizzle thats
how we do and if you want to learn more than you
just scored because we believe that you can succeed
if you remember that!!!!!!!!!!!!!!!!!!!!!!*

Looking at Student Work – Instructor notes and rating for work sample #3:

A student example of a metric song. This was one of the activities that really interested many of the students. They loved to perform them. When we first started discussing the metric system one of the students told the class he remembered the prefixes of the metric system and their order by the saying *King Henry Died Monday Drinking Chocolate Milk*. The entire class used that for the rest of the year whenever they had to convert within the metric system.

INSTRUCTIONAL NOTES

Author Note

This was a very high interest activity for all students. Many created games using the metric system. I had students from other classes come in and ask if they could play the game so and so created. They were even playing them on the bus ride to school in the morning.

Adaptations

Task activities can easily be modified to fit the level of your student's knowledge of the metric system. Students could be required to complete a tic-tac-toe pattern. Higher ability students may do more in-depth activities. Lower ability students may do fewer or less in-depth activities. Computers may be used if available.

Resources

SD Mathematics Content Standards

<http://www.doe.sd.gov/contentstandards/math/index.asp>

SD Assessment and Testing

<http://www.doe.sd.gov/octa/assessment/index.asp>

The National Assessment of Educational Progress (NAEP)

<http://www.doe.sd.gov/octa/assessment/naep/index.asp>

National Council of Teachers of Mathematics

<http://nctm.org/>

Looking at Student Work

<http://www.lasw.org/index.html>